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Post-operative surgical site infections in caesarean section, abdominal and vaginal hysterectomies

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Abstract

Background: Surgical site infections (SSI) are the third most commonly reported nosocomial infections and they account for approximately a quarter of all nosocomial infections. They are responsible for increasing hospital stay which results in social and economic loss to the patient and family. Host factors, wound factors and surgery related factors are implicated in causation of SSI. The aim of the study was to find out the prevalence of postoperative surgical site infections and to evaluate the risk factors among Caesarean sections, Abdominal and Vaginal Hysterectomies.

Materials and Methods: This prospective observational study was carried out over a period of 6 months from February 2017 to August 2017. Patients undergoing Caesarean sections, Abdominal and Vaginal Hysterectomies who fulfilled the inclusion criteria were enrolled in the study. All patients suspected of having SSI within 10 days of operation were identified. Suspected SSI was confirmed by culture and sensitivity of wound swabs as soon as the diagnosis was suspected.

Results: During study period, 120 patients underwent Caesarean sections, Abdominal and Vaginal Hysterectomies. Out of which 21patients developed SSI with overall prevalence being 17.5%. Mean age among the study group was 36.69±13.54 years. Mean duration of all surgeries was 56.54±22.74min. Anaemia 30.8%, hypertension 22%, diabetes 17%, obesity 8% were the common risk factors noted among infected patients.

Conclusion: SSI continues to be a significant postoperative complication. Anaemia, hypertension, diabetes and obesity were the risk factors associated and increased prevalence of SSI seen in emergency surgeries. SSI increases morbidity by increasing duration of hospital stay. Better understanding of risk factors for SSI can help target efforts at reducing modifiable risks to prevent infection and to better risk stratification in reporting quality outcomes.

Keywords: surgical site infections, abdominal, vaginal hysterectomies, nosocomial infections

Introduction

Surgical site infections (SSI) are the third most commonly reported nosocomial infections and they account for approximately a quarter of all nosocomial infections. They make up to 14-16% of inpatient infections [1].They are responsible for increasing cost, morbidity and mortality related to surgical operations and continues to be even in hospitals with most modern facilities and standard protocols of preoperative preparation. They have adverse impact on the hospital as well as on the patient. They are responsible for increasing length of stay of patient which results in social and economic loss to the patient and family. Host factors, wound factors and surgery related factors are implicated in the causation of SSI [2].

Postoperative wound infection is a major complication of surgery. The manifestation of postoperative wound infection has a tri-factorial basis: the overall systemic trauma, local host damage, and bacterial contamination of the wound. The progression of a wound to an infected state involves a multitude of microbial and host factors such as type, site, size and depth of the wound, the extent of nonviable exogenous contamination, level of blood perfusion to the wound, general health and immune status of the host.

The caesarean section nowadays is a commonly performed surgical procedure. It is a clean category surgery according to classification [3]. Post caesarean section SSI is a frequent occurring. It poses a substantial health risk with regards to prolonged hospital stay, morbidity, mortality, costs and inappropriate use of broad spectrum antibiotics leading to antimicrobial resistance [4].

Hysterectomy is the second most common operation performed by the Gynaecologists next only to caesarean section and can be done through abdominal, vaginal and laparoscopic routes. Traditional abdominal and vaginal hysterectomies represent the most and least invasive techniques respectively. The Vaginal approach to hysterectomy has been the hallmark of the gynaecological surgeon. The impetus to extend the advantages and explore the limits of the vaginal route came from hands on experience with patients who were desperate to avoid an abdominal incision. The pooled rate of SSI after abdominal hysterectomy as reported by the National Healthcare safety Network for 2006-2007 was 1.7% and the rate after vaginal hysterectomy was 0.9%[5]. Rates of SSI after hysterectomy reported in individual studies range widely depending on approach and surgical method of hysterectomy, indication for operation and

the use of antimicrobial prophylaxis.

This study was conducted to find out the prevalence of postoperative surgical site infections and to evaluate the risk factors among Caesarean sections, Abdominal and Vaginal Hysterectomies.

Materials and Methods

The prospective observational study of SSI was carried out in Department of Obstetrics and Gynaecology in KVG Medical College and Hospital from February 2017 to August 2017 after obtaining approval from the ethical committee.

Inclusion criteria

1. Patients undergoing caesarean section, abdominal hysterectomies and vaginal hysterectomies.
2. Wound infection occurring within 10 days of operation

Exclusion criteria

1. Patient not giving consent
2. Patient known case of HIV
3. Patient on immunosuppressive therapy or chemotherapy or suffering from any autoimmune disease
4. Patient with signs or symptoms of preoperative infections
5. Duration of surgery >4hrs
6. Patient on steroid therapy
7. Obesity BMI >30kg/m2

A written and informed consent was obtained from each patient after explaining regarding the inclusion into the study, nature of surgery, indication of surgery, benefits of surgery and risks involved in surgery**.** Patients were not given any benefit for involving in the study. Complete physical examination was carried out to rule out any local or systemic infections. Blood and serological investigations were performed as prerequisite for anaesthesia. Shaving of the abdominal wall and perineum was done as a preparation procedure. All operations were performed under spinal anaesthesia. Patients were monitored for the evidence of infective morbidity by measuring oral temperature every 4 hourly, pain, serous/purulent/blood stained discharge, tenderness, redness at surgical site, wound dehiscence, leucocytosis, isolation of organisms in discharge or blood.

Following criteria were used to diagnose SSI, wound dehiscence or febrile morbidity.

a. Febrile morbidity - This was defined as febrile episodes of > 38°C, occurring on two occasions, at least 4 hours apart, after 24 hours following the operation.
b. Surgical site infection - This was defined as (a) erythema and or induration (b) serous oozing (c) the presence of pus
c. Wound dehiscence – Separation of edges of suture line by more than 1cm- superficial or deep as per CDC guidelines.

The wound was checked on 4th postoperative day routinely or according to complaints of patients. In case of occurrence of febrile morbidity or surgical site infections, total leucocyte count, differential leucocyte count, ESR, wound swabs for culture and sensitivity were sent.

Data related outcome variables age, body mass index, associated risk factors, indication of surgery, nature of surgery, emergency or elective, route of surgery, technique of surgery, duration of surgery, duration of anaesthesia, intraoperative complications, infective morbidity, surgical site infections, hospital stay and wound related complications was collected. Information was collected in structured proforma and then entered in Microsoft office excel sheet for analysis using statistical package for the social sciences (SPSS) version 16. Continuous variables were expressed as mean ±SD, categorical variables were expressed as frequencies and percentages and t test was applied to find the association between different variables. P value less than 0.05 were considered significant.

Results

In present study based on our inclusion criteria 120 patients were eligible for analysis. Postoperative Surgical site infectios were noted in 21 patients with overall prevalence rate of 17.5%. The mean age of the patients in the study was 36.69±13.54years.Wound infection rate was higher among 20-34 years age group (17.39%).

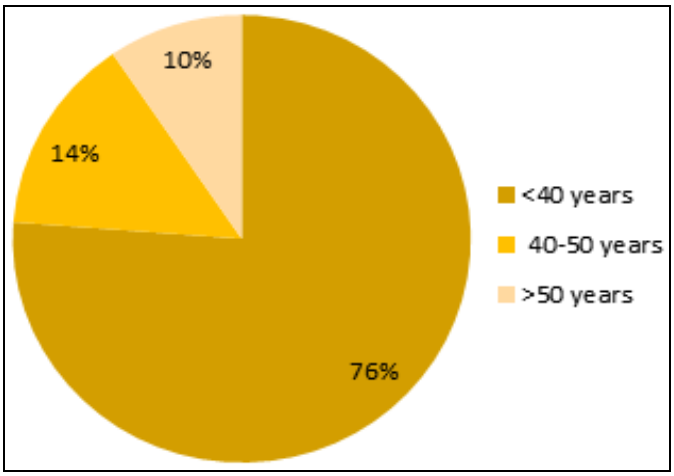

Fig 1: Association of age with wound infection infection

The wound infection rate was found to be more among the patients who underwent Total abdominal hysterectomies in comparison with vaginal hysterectomies and caesarean sections. (Table 1)

Table 1: Age, Types of surgery and frequency of SSI distribution among study population

Type of surgery	No. of cases	Frequency of wound infection	Percentage
Elective caesarean section	22	2	9.09%
Emergency caesarean section	51	11	21.5%
Vaginal hysterectomy	30	3	10%
Total Abdominal hysterectomy	17	5	29.41%

Table 2: Risk factors in post operative wound infection patients

	Risk factors	No. of cases	Percentage
1	Advanced Age(>70years)	5	4.17%
2	Diabetes	17	14.17%
3	Obesity	8	6.67%
4	Hypertension	22	18.33%
5	Anaemia	37	30.83%
6	No risk factors	36	30%

Table 3: Association between duration of surgery and wound infection

Sl. No.	Wound infection	Duration of surgery	t Value	p Value
1	Present	68.09+_34.11	2.6263	0.0098
2	Absent	54.09+_18.85		

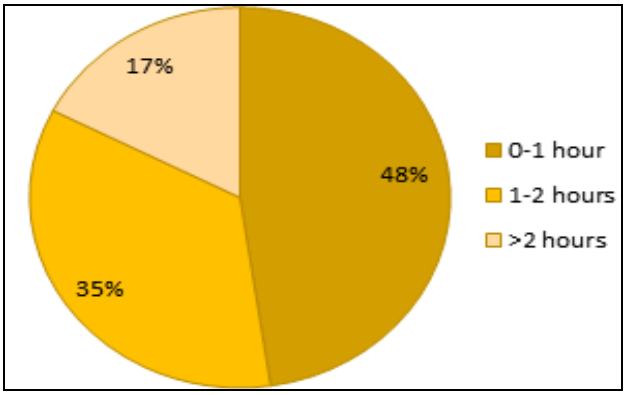

Fig 2: Duration of surgery of SSI cases

The mean duration of all the surgeries was 56.44+_22.73 minutes. Mean duration of surgery among infected patients was 68.09+_34.11 minutes. In our study it is noted that most of the infected patients had duration of surgery <60 minutes.

Table 4: Association between the duration of hospital stay and wound infection

Sl. No.	Wound infection	Duration of hospital stay	t Value	p Value
1	Present	11.05+_2.39	10.9841	<0.0001
2	Absent	6.76+_1.42		

The wound infection rate was found to be more amongst emergency cases (21.57%) as compared to elective (14.49%) in our study.

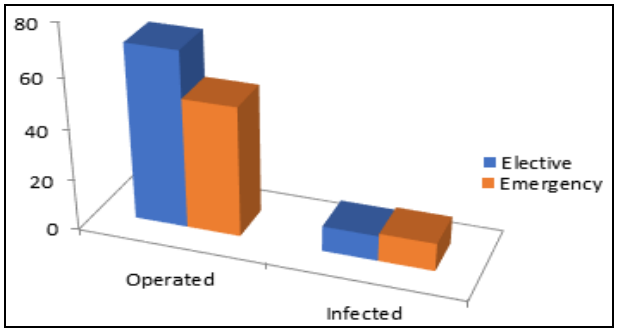

Fig 3: Postoperative Wound infection rate in Elective and Emergency surgeries

Discussion

Surgical site infections constitutes global health problem. They are both Economical burden and physical harm to the patients. They are also the index of health care system in the hospital. Multiplicity of factors influence SSI rate in clinical practice.

Mean age of the patients in our study was found to be 36years. Certain underlying conditions like anaemia, diabetes and obesity may decrease the immune status thus significantly increasing the risk of SSI. They are also an important cause of increasing the duration of hospital stay to the patient which in turn steeply increases the risk of SSI in such patients [3]. Anaemia (30.83%), Hypertension (18.33%), Diabetes (14.17%) and Obesity (6.67%) were overall common risk factors in postoperative wound infected patients. There was a strong relationship between anaemia and wound infection in our study as was found by Zaman F (2011) [4] in her study. Each day of extra hospitalisation adds to the risk of acquiring SSI and this has been confirmed by studies in Aurangabad [6], Mumbai [7], Hyderabad [8] and in Orissa [9].

Diabetes was found in 14.17% of patients who underwent surgery which is quite comparable with the Dhaka study group[9].High blood sugar can increase infection rate and impair wound healing. Poorly controlled diabetes adversely affects the ability of leukocytes to destroy invading bacteria and to prevent the harmful proliferation of usually benign bacteria present in the healthy body. In the present study 17 patients with diabetes developed SSI out of 21 infected patients showing its predisposition with SSI. This agrees with the findings of other researchers who all reports increased predisposition of diabetes to surgical wound infection in their centres [11, 12, 13].

Prolonged duration of surgery results in increased exposure of operation site to air, prolonged trauma, prolonged anaesthesia and blood loss [3]. Surprisingly our study showed that maximum number of infected patients (48%) operated in <60 minutes which is contradictory to the studies conducted on SSI in Aurangabad [6], Mumbai [7], Hyderabad [8] and Orissa [9].

It is observed that patients with no risk factors may also develop SSI. Emergency surgeries are more prone for SSI and even patient undergoing surgery of shorter duration may also develop SSI.

Conclusion

SSI continues to be a significant postoperative complication. Anaemia, hypertension, diabetes and obesity were the common risk factors associated with infected patients. SSI increases morbidity in terms of increased duration of hospital stay. Prevalence of SSI was more in emergency surgeries. Hence identification of risk factors should be done in all

patients effectively which may decrease the prevalence of SSI and help in active measures for its control.

References

1. Skayzynska J, Ciencala A, Madry R *et al*. Hospital infection in general surgery wards. Przegl Epidemiol. 2000; 54(3-4):299-304.
2. Wong ES. Surgical site infections. In: Mayhall CG, editor. Hospital epidemiology and infection control. 1st ed. USA: Williams and Wilkins, 1996, 154-74.
3. Berard F, Gandon J. Factors influencing the incidence of wound infection. Ann Surg.1964; 160:32-81.
4. Zaman F. Profile of wound infection following caesarean section delivery at Institute of Child & Mother health, Matuail, Dhaka. Dissertation, Bangladesh College of Physicians and Surgeons, 2011.
5. Edwards JR, Peterson KD, Andrus ML, Dudeck MA, Pollock DA, Horan TC. National Healthcare Safety Network (NHSN) report, data summary for 2006 through 2007, issued November Am J Infect control. 2008; 36:609-626.
6. Anvikar AR, Deshmukh AB, Karyakarte RP, Damle AS, Patwardhan NS, Malik AK, *et al*. A one year prospective study of 3280 surgical wounds. Indian J Medical Microbiol. 1999; 17(3):129-32.
7. Lilani SP, Jangale N, Chowdhary A, Daver GB. Surgical site infection in clean and clean contaminated cases. Indian J Medical Microbiol. 2005; 23(4):249-52.
8. Rao AS, Harsha M. Postoperative wound infections. J Indian MA. 1975; 64(4):90-3.
9. Tripathy BS, Roy N. Postoperative wound sepsis. Ind J Surg. 1984; 47:285-8.
10. Rahman Jahanara, Sultana Nasreen, Hasan Munir, Begum Hosne Ara, Factors of post-operative wound infections in abdominal surgeries of Obstetrics and Gynaecology, Dept; Journal of Dhaka Medical College Hos. 2011; 18(01):39-42.
11. Kamat US, Fereirra AMA, Kulkarni MS, Motghare DD. A prospective study of surgical site infections in a teaching hospital in Goa. Ind J Surg. 2008; 70:120-124.
12. Alsaimary IEA. Bacterial wound infections in diabetic patients and their therapeutic implications. Med Pract Rev. 2010; 1(2):12-15.
13. Ibrahim MK, Salama MS, Mustafa RM. Studies on surgical wound nosocomial infections. J Union Arab Biol Cairo. 1998; 6(13):115-128.